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ORIGINAL RESEARCH

Genotypic and antimicrobial resistance characterizations of *Cronobacter sakazakii* isolated from powdered milk infant formula: A comparison between domestic and imported products

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Abstract

Cronobacter sakazakii, an opportunistic foodborne pathogen and a main cause of meningitis in neonates, is usually isolated from powdered milk infant formula (PMIF). At the present study, *C. sakazakii* were isolated from imported and domestically produced PMIF samples and identified by detection of *ompA* gene using real-time PCR SYBR green melting curve following the evaluation of antimicrobial susceptibility and genotyping of the isolates employing BOX-PCR and RAPD methods. We detected totally 5% contamination rate and a significantly higher prevalence of *C. sakazakii* in bulky imported domestically packaged PMIF samples. Also, our isolates were recognized as multidrug-resistant pathogen completely resistant to ampicillin and amoxicillin; and intermediately resistant to ciprofloxacin and tetracycline antimicrobials. Genotype clustering patterns of bulky imported and imported product isolates were identical by both genotyping methods. Far genetic relatedness of domestic isolate to other isolates and the reference strain indicated higher genetic diversity of the domestic isolate genome. Multidrug resistance and diverse population genetic make complicated situation for determination of strategies for infectious disease prevention.

KEYWORDS

antimicrobial susceptibility, *Cronobacter sakazakii*, genotyping, powdered milk infant formula

1 | INTRODUCTION

Not appreciated by pediatric and nutrition specialists, powdered milk infant formula (PMIF) is the most recommended alternative of breast milk for neonatal feeding (Lönnerdal, 2016). Several types of research appreciated the importance of safety and microbial quality for powdered milk and its derivatives consumed by infants and newborns (Martin, Ling, & Blackburn, 2016). Milk, before drying, is